

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

(DRAFT)

Title V, Operating

Permit: V-08-016

Kingsford Manufacturing Company

Burnside, KY 42519

June 17, 2008

Massoud Kayvanjah & Chris Walling

SOURCE ID: 21-199-00018

AGENCY INTEREST: 3816

ACTIVITY: APE20080001

**SOURCE DESCRIPTION:**

On May 5, 2008, Kingsford Manufacturing Company (KMC) at Burnside applied to the Division for the renewal of their permit V-03-018 R3. KMC manufactures charcoal briquets mixed with additives (Limestone, Starch, and Solvent).

The facility is classified as a Title V major source of air pollution based on emissions of more than 100 tons per year of particulate matter less than 10 micrometers (PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and volatile organic compounds (VOC).

**Significant emission units:**

- E. Unit 01      Wood (chips/sawdust) receipt and storage.
- E. Unit 02      Wet Wood (chips/sawdust) Rotary Dryer is heated by After Combustion Chamber (ACC) using two fuel oil #2 burners rated each at 40 MMBtu/hr, and a Dry Wood Charring Furnace (Retort Furnace) with six natural gas startup burners each rated at 1.5 MMBtu/hr. All emissions from the wet wood dryer and the charring furnace after passing through cyclones are vented into the After Combustion Chamber (ACC) and into the auxiliary fuel oil burner for briquets dryers.
- E. Unit 03      Briquets Cooler B
- E. Unit 04      Briquets Cooler C
- E. Unit 05      Briquets Manufacturing Dust Collector (pre-packaging)
- E. Unit 06      Briquets Packaging and Bagging Dust Collector
- E. Unit 07      Briquets Dryer A,
- E. Unit 08      Briquet Dryer B

- E. Unit 09      Briquets Dryer C  
All Dryers A, B, and C receive heat from one 50 MMBtu/hr fuel oil burner.
- E. Unit 10      Fuel oil #2 fired boiler rated at 12.6 MMBtu/hr
- E. Unit 11      Plant roads (paved and unpaved)
- E. Unit 37      Solvent Treated Briquets (STB) production line
- E. Unit 38      Briquets Cooler A

**COMMENTS:****E. Unit 01:    Wood receipt and storage**

A dust suppression system controls fugitive dust emissions during unloading 337,260 tons of dry wood (chip and sawdust) per year. The wood is wet prior to entering the dryer. For emission reporting and fee assessment, an emission factor of 0.10 lb/ton for PM and 0.0473 lb/ton for PM<sub>10</sub> from dry wood were used by Kingsford based on engineering judgment, which based on AP-42 emission factors for similar wood handling operations in Kentucky, the emission factors used by Kingsford are conservative numbers. Monitoring and record keeping of the throughput rate of dry wood shall be maintained on a monthly basis to estimate emissions from this unit. The rate of dry wood processed is calculated from the rate of wet wood by the conversion dry wood equals 50% of wet wood, based on literature and past testing of materials used at the plant. This conversion was also used for all stack testing and calculations to determine emission factors.

401 KAR 63:010, Fugitive Emissions and 401 KAR 51:017, Prevention of Significant Deterioration of air quality (BACT for PM/PM<sub>10</sub>) applies to the operating and emission limitations. The permittee shall limit the throughput of the amount of dry wood received such that the maximum annual total (12-month rolling average) does not exceed 337,260 tons per year.

Compliance with operating and emission limitations to suppress and minimize fugitive emissions will be demonstrated by dust suppression during wood truck unloading, and good operating practices during material handling.

**EU-02    Wet Wood Rotary Dryer and Dry Wood Charring Furnace (Retort Furnace) – both controlled by After Combustion Chamber (ACC) with ACC stack**

The wet wood dryer has been replaced with a new rotary dryer of higher capacity. The existing retort furnace constructed in 1969 maintains the same throughput since the last permitting action. The maximum operating limit is 77 tons/hr of wet wood to the rotary dryer (P<sub>1</sub>) and 38.5 tons/hr of dry wood to the furnace (P<sub>2</sub>). Emissions from the wood dryer and the retort furnace go through cyclone separators. The gases from the cyclone exhausts are combined in the ACC.

**Applicable regulations and emissions limits:**

401 KAR 59:010	New process operations applicable to emission units commenced on or after July 2, 1975.
401 KAR 51:017	Prevention of significant deterioration of air quality - BACT for nitrogen oxides (NO <sub>x</sub> ), sulfur dioxide (SO <sub>2</sub> ), PM, PM <sub>10</sub> and volatile organic compounds (VOC)
40 CFR 64	Compliance Assurance Monitoring (for PM <sub>10</sub> )

Pursuant to 401 KAR 51:017, under normal operating conditions with no more than 80% of the emissions going out the ACC stack, emissions into the open air from the ACC stack shall not exceed the following limits:

- 1) 60.60 lbs/hr of PM
- 2) 48.48 lbs/hr of PM<sub>10</sub>
- 3) 92.71 lbs/hr of NO<sub>x</sub>
- 4) 24.24 lbs/hr of SO<sub>2</sub>
- 5) 7.13 lbs/hr of VOC

Under circumstances when 20% of the total exhaust cannot be diverted to the briquets dryers and to the 55 MMBtu/hr fuel oil boiler (greater than 80% of total flow out the ACC stack), the maximum material throughput of wet wood to the dryer shall not exceed 62.6 tons/hr, and the maximum throughput of dry wood to the retort furnace rate shall not exceed 31.3 tons/hr to comply with 401 KAR 59:010.

Pursuant to 401 KAR 59:010, under operating conditions with greater than 80% of the emissions going out the ACC stack, the process rate shall be limited so that based on a three hour average the particulate matter emissions into the open air shall not exceed:

$$\text{Combined Allowable PM Emission} = 17.31(P_1)^{0.16} + 17.31(P_2)^{0.16} = 63.02 \text{ lb/hr on a 3 hr average}$$

where the max  $P_1 = 62.6 - (0.1)(62.6) = 56.34$ , assuming 10% uncombined moisture in wet wood and the max  $P_2 = 31.3$ , from the combined emissions in the ACC unit.

Under normal operating conditions, the two cyclones for the wood dryer, the four cyclones for the retort furnace, and the ACC for the combined gas stream shall be operating, and the ACC combustion chamber operating temperature shall remain above 1400°F on a 3-hour average. Immediate corrective actions shall be taken whenever the 3-hour average operating temperature of the ACC combustion chamber falls below 1400°F or the temperature reading of the two thermocouples in the ACC combustion chamber is not within plus/minus 100°F of each other.

Stack testing for performance test shall be performed concurrently with emission units 02, 03, 04, 07, 08, 09, 37, and 38 by the start of the fourth year of this permit (or the fourth year from the last stack test) to determine compliance with the applicable emissions standard. Stack testing was performed in November 2007 to determine emission rates from the ACC stack.

Pursuant to 40 CFR 64, the permittee has specified the parameter, frequency, and quality control of the monitoring equipment. The temperature shall be monitored from a thermocouple in the ACC every

second. The second thermocouple shall be checked weekly for difference from the first thermocouple and corrective actions shall be taken when the temperature difference is greater than 100 degrees. In addition the permittee shall perform a qualitative visual observation of the opacity of emissions from the stack on a weekly basis and maintain a log of the observations.

If visible emissions from the stack are seen (not including condensed water vapor within the plume); then the opacity shall be determined by Reference Method 9. If emissions are in excess of the applicable opacity limit, then an inspection shall be initiated of control equipment for all necessary repairs. The permittee shall also monitor the wood processing rate and hours of operation on a daily basis.

For emission reporting and fee purposes, the following emission factors shall be used based on the November 2007 stack test data from ACC: 45.27 lb/hr for NO<sub>x</sub>; 0.056 lb/ton of briquets for CO; 1.64 lb/hr for SO<sub>2</sub>; and 0.09 lb/hr for VOC; 32.35 lbs/hr for PM, and 26.61 lb/hr for PM<sub>10</sub>.

### **EU-03 Briquets Cooler B**

The maximum throughputs and the potential air emissions from this unit have not changed since the initial Title V permit. The maximum production rate for the existing Cooler B is 7 tons of briquets per hour. The unit is subject to a production PM emission limitation, 401 KAR 61:020:

$$E = 4.10(7)^{0.67} = 15.10 \text{ lbs PM/hr}$$

For compliance demonstration with the particulate matter emission limits the emission factor of 0.06 lb/ton (0.27 lb/hr) based on the stack test performed in November 2007 shall be used.

### **EU-04 Briquets Cooler C**

The maximum throughputs and the potential air emissions from this unit have not changed since the past permitting action. The maximum production rate for the new Cooler C is 8 tons of briquets/hr. The unit is subject to a production PM emission limitation, 401 KAR 59:010:

$$E = 3.59(8)^{0.62} = 13.03 \text{ lbs PM/hr}$$

For compliance demonstration with the particulate matter emission limit, the emission factor of 0.03 lb/ton (0.18 lb/hr) based on the stack test performed in November 2007 shall be used.

### **EU-05 Briquets Manufacturing Dust Collection (pre-packaging) and**

### **EU-06 Briquets Packaging and Bagging Dust Collection**

Separate baghouses each with a 98% rated efficiency are the control devices for the briquets manufacturing and the briquets packaging and bagging areas. Emission factors were calculated based on the maximum rated volumetric flow rate for each collector and the maximum outlet PM concentrations (gr/scf) from vendor control device estimates.

The maximum particulate matter emissions from the dust collectors (EU-05) are limited by the throughput of 27 tons/hr for briquets dryers. Based on 401 KAR 59:010, the particulate matter emission limit from dust collectors shall be  $3.59(27)^{0.62} = 27.70$  lbs/hr based on three hour average.

For calculating PM emissions, an emission factor of 0.20 lbs/ton of briquets shall be used.

The maximum PM emissions from briquets packaging and handling dust collectors (EU-06) are limited by a briquets packaging limit of 30 tons/hr. Based on 401 KAR 59:010, the particulate matter emission limit from dust collectors shall be  $3.59(30)^{0.62} = 29.57$  lbs/hr based on three hour average.

For calculating PM emissions, an emission factor of 0.18 lbs/ton shall be used.

For compliance with the PM emission limits, the filters shall be operated and used to maintain compliance, in accordance with manufacturer's specifications and/or standard operating practices.

#### **EU-07 Briquets Dryer A**

The maximum throughput for charcoal briquets dryer A is 12 tons/hr. The allowable emission of PM is 6 lbs/hr and for  $PM_{10}$  is 3.6 lbs/hr based on the BACT analysis.

For compliance with the PM and  $PM_{10}$  emission limits from dryer, an emission factor of 0.10 lb/ton (or 0.83 lb/hr) for PM, and 0.07 lb/ton (or 0.57 lb/hr) for  $PM_{10}$  shall be used based on November 2007 stack test.

#### **EU-08 Briquets Dryer B**

The maximum throughputs and the maximum potential air emissions from this unit have not changed since the initial Title V permit. Briquets Dryer B is a pre 7/2/75 unit, and is subject to 401 KAR 61:020. The maximum rate for charcoal briquets through the dryer is 7 tons/hr. The allowable emissions for particulate matter (PM), is 15.10 lbs/hr based on three hour average.

Stack testing was performed in November 2007 using EPA Reference test methods to determine emission rates of PM from both stacks of the unit. For compliance with the PM emission limit, based on the stack test an emission factor of 0.54 lb/hr or 0.11 lb/ton of briquets for PM shall be used.

#### **EU-09 Briquets Dryer C**

Briquets Dryer C is a post 7/2/75 unit, subject to 401 KAR 59:010 and 401 KAR 51:017 based on the past permitting action. The maximum rate for charcoal briquets through the dryer is 8 tons/hr. The allowable emissions for PM, is  $3.59(8)^{0.62} = 13.03$  lbs PM/hr based on three hour average.

For compliance with the PM emission limit, an emission factor of 0.15 lb/ton of briquets for PM shall be used, based on the November 2007 stack test, shall be used.

**EU-10 Waste Heat Boiler rated at 12.6 MMBtu/hr (Burning fuel oil #2)**

The waste heat boiler produces steam for process operations. The waste heat boiler influent is from a percentage of the ACC exhaust gases. The waste heat boiler operates in one of two modes:

1. Heat from the ACC exhaust with no oil firing in the boiler; or
2. Heat from the ACC exhaust with firing distilled fuel oil (0.5% sulfur) in the boiler.

The applicable regulations and emission limitations are dependent on the method of operation.

**1. Heat from percentage of the ACC exhaust without oil firing in the boiler**

Past performance test determined the measured flowrate of gases through the ACC and the waste heat boiler stack. Based on that testing, a maximum 5.5% of the ACC exhaust goes to the waste heat boiler. Based on this flowrate and the ACC stack testing for all regulated air pollutants, the following emission factors shall be used for emission reporting and fee purposes, until this ACC stack test is updated: PM is 0.12 lb/ton of dry wood; PM<sub>10</sub> is 0.095 lb/ton of dry wood; NO<sub>x</sub> is 0.094 lb/ton of dry wood; CO is 0.0048 lb/ton of dry wood; SO<sub>2</sub> is 0.0045 lb/ton dry wood; and 0.014 lb is VOC/ton dry wood. The maximum rate for dry wood is 38.5 tons/hr. Note that the waste heat flowrate at normal operating condition is 20% of the total ACC affluent, hence an equivalent proportionate factor should be considered for using the above emissions factors obtained at 5.5% waste heat flow to calculate emissions from the waste heat burner.

**2. Waste heat from percentage of the ACC exhaust with fuel oil firing, 0.5 %S**

40 CFR 60, Subpart Dc, limits the percent of sulfur in the fuel to 0.5 weight percent sulfur. Compliance with this limitation will be obtained from the use of low sulfur fuel, as certified by the vendor, and monitoring and recordkeeping of the fuel used in the heat exchanger.

401 KAR 59:015 applies to new indirect heat exchangers:

Particulate matter =  $0.9634 (12.6)^{-0.2356} = 0.53 \text{ lbs/MMBtu}$  based on 3 hour average

Sulfur dioxide (SO<sub>2</sub>) =  $7.7223 (12.6)^{-0.4106} = 2.73 \text{ lbs/MMBtu}$  based on 24 hour average

For compliance with the PM and SO<sub>2</sub> emission limit, an emission factor of 0.014 lbs PM/MMBtu and (1.07)(0.5% Sulfur) = lbs SO<sub>2</sub>/MMBtu shall be used, based on AP-42 emission factors, and the heat capacity of the heat exchanger.

The following emission factors shall be used to determine the emissions from the unit's fuel consumption, based on AP-42 emission factors: 0.007 lb PM<sub>10</sub>/MMBtu; 0.143 lb NO<sub>x</sub>/MMBtu; 0.036 lb CO/MMBtu; and 0.002 lb VOC/MMBtu. Note that these emission factors do not include the emissions already going through the waste heat boiler from the ACC exhaust.

**EU-11 Plant roads**

Pursuant to 401 KAR 63:010, no person shall cause, suffer, or allow any material to be handled, processed, transported, or stored without taking reasonable precaution to prevent particulate matter from becoming airborne. No person shall cause or permit the discharge of visible fugitive dust emissions beyond the lot line of the property on which the emissions originate.

The emission factors for paved and unpaved roads are based on AP-42 emission factors. Road silt loading and silt content of unpaved roads was calculated from site testing. Site data used for the past permitting action is being used to estimate the vehicle miles traveled on each road with an estimated 30 tons in each truck. There was an average of 120 days per year greater than 0.01 inches of rainfall. The speed limit for all facility roads is 10 miles per hour.

For compliance, the facility shall maintain records of the calculations to determine the fugitive emissions from paved and unpaved roads with all data used in the calculations. Records shall be maintained for the current year and the two previous years. Compliance with the fugitive emission limitation may include the washing of paved roadways and washing of vehicles and vehicular tires before exiting the facility, if necessary. The facility has also posted 10 miles per hour sign on facility property.

**EU-37 Solvent Treated Briquets (STB) production line**

The STB production line is subject to 401 KAR 51:017. The facility shall use an emission factor of 64.80 pounds of VOC per 1,000 gallons of lighter fluid with 95% destruction efficiency from the ACC unit for VOC emissions until emissions factors are updated by source testing.

Compliance is demonstrated through the monitoring and recordkeeping of the lighter fluid usage rate and the STB production rate in any consecutive twelve months total. The lighter fluid usage shall be averaged on a weekly basis to insure permit limitations are not exceeded.

**STB facility fugitive emissions:**

The STB production line and dryers A, B, and C are subject to 401 KAR 51:017. Emissions from the STB production line contain particulates and VOCs that are recycled through the briquets dryers. Pursuant to 401 KAR 51:017, VOC emissions from the dryers (EU-07, 08, and 09) shall not exceed 51.9 lbs/hr averaged on a daily basis and 169.3 tons in any consecutive twelve months period.

For emission reporting and fee purposes, the emission factor is 2.23 pounds of VOC per ton of STB produced (including both the rerun fines and the tank recycle fines) based on the existing permit.

Compliance is demonstrated with the solvent usage rate limitation on EU-37. All limitations and requirements from the existing permit are rolled over into this renewal permit. No significant changes have been made to the STB production line since the last permitting action.

**EU-38 Briquets Cooler A**

Pursuant to 401 KAR 51:017, the maximum throughput of briquets into the cooler A shall be 12 tons/hr. The allowable emission for PM is 6 lbs/hr, and 3.6 lbs/hr for PM<sub>10</sub>, based on the BACT analysis.

For compliance with the PM emission limit, based on the November 2007 stack test an emission factor of 0.10 lbs/ton of PM for dry briquets and 0.04 lb/ton of PM<sub>10</sub> for dry briquets shall be used.

**Insignificant Activities:**

The Insignificant Activities have been revised by the renewal application dated May 5, 2008. The Dry Heat Burners (Two units 40 MMBtu/hr oil burners) and Furnace startup burners (Six units natural gas heat starters for the Unit#2 retort furnace) has been removed from the insignificant activity list and moved to Section B of the permit and listed under emission unit 02.

**Regulations not applicable:**

40 CFR, Part 64 – Compliance Assurance Monitoring, does not apply for the monitoring of NO<sub>x</sub> emissions from the ACC, because low-NO<sub>x</sub> burners and staged combustion are exempted by 40 CFR Part 64 definitions.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.